

CLAIMS

What is Claimed is:

1 1. A method of storing program material for subsequent replay, comprising
2 the steps of:

3 (a) accepting encrypted access control information and the program material
4 encrypted according to a first encryption key, the access control information including a
5 first encryption key and control data;

6 (b) decrypting the received access control information to produce the first
7 encryption key;

8 (c) decrypting the program material using the first encryption key;

9 (d) re-encrypting the program material according to a second encryption key;

10 (e) encrypting the second encryption key according to a third encryption key
11 to produce a fourth encryption key; and

12 (f) providing the re-encrypted program material and the fourth encryption key
13 for storage.

1 2. The method of claim 1, wherein the encrypted access control information
2 further comprises temporally-variant control data, and the method further comprises the
3 steps of:

4 decrypting the received access control information to produce the temporally-
5 variant control data; and

6 modifying the temporally variant control data to generate temporally-invariant
7 control data.

1 3. The method of claim 1, wherein steps (b) and (e) are performed in a
2 conditional access module.

1 4. The method of claim 3, wherein the conditional access module is
2 implemented on a smartcard communicatively coupleable to a tuner and a media storage
3 device.

1 5. The method of claim 1, wherein the access control information further
2 comprises metadata describing at least one right for the program material.

1 6. The method of claim 5, further comprising the step of:
2 generating the second encryption key at least in part from the metadata.

1 7. The method of claim 1, wherein steps (b)-(f) are performed in response to
2 a pre-buy message.

1 8. The method of claim 7, wherein the access control information further
2 comprises metadata describing at least one right for the program material, and the method
3 further comprises the step of:
4 generating replay right data from the metadata.

1 9. The method of claim 8, wherein the replay right data is further generated
2 from pre-buy data.

1 10. The method of claim 1, further comprising the steps of:
2 retrieving the stored re-encrypted program material and the fourth encryption key;
3 decrypting the fourth encryption key using the third encryption key to produce the
4 second encryption key; and
5 decrypting the re-encrypted material using the second encryption key.

1 11. The method of claim 10, wherein the step of decrypting the fourth
2 encryption key using the third encryption key to produce the second encryption key is
3 performed in response to a subscriber request to access the program material.

1 12. The method of claim 11, wherein the access control information further
2 comprises metadata describing at least one right for the program material, the subscriber
3 request to access the program material comprises buy data, and the method further
4 comprises the steps of:

5 generating replay right data from the metadata;
6 accepting the buy data;
7 comparing the buy data with the replay right data; and
8 decrypting the fourth encryption key using the third encryption key to produce the
9 second encryption key according to the comparison between the buy data and the replay
10 right data.

1 13. The method of claim 12, wherein steps (b)-(f) are performed in response to
2 a pre-buy message, and wherein:

3 the second encryption key and the third encryption key are stored in a smartcard,
4 and the replay right data is generated from the metadata and the pre-buy message in the
5 smartcard; and

6 the steps of accepting the buy data, comparing the buy data with the replay right
7 data, and decrypting the fourth encryption key using the third encryption key to produce
8 the second encryption key according to the comparison between the buy data and the
9 replay right data are performed in the smartcard.

1 14. The method of claim 1, wherein the re-encrypted program material and the
2 fourth encryption key are stored on a media storage device.

1 15. The method of claim 1, wherein the control data is temporally-variant.

1 16. The method of claim 15, wherein the temporally-variant control data
2 associates an expiration time with the program material.

1 17. An apparatus for storing program material encrypted according to a first
2 encryption key for replay, comprising:

3 a conditional access module, for accepting encrypted access control information
4 including the first encryption key and temporally-variant control data, the control access
5 module comprising:

6 a first decryption module, for decrypting the access control information to
7 produce the first encryption key;

8 a first encryption module, for encrypting a second encryption key with a
9 third encryption key to produce a fourth encryption key; and

10 a second decryption module for decrypting the fourth encryption key to
11 produce the second encryption key.

1 18. The apparatus of claim 17, further comprising:

2 a tuner, communicatively coupleable to the conditional access module for
3 receiving the encrypted access control information and the program material encrypted
4 according to a first encryption key;

5 a third decryption module, for decrypting the program material using the first
6 encryption key produced by the conditional access module;

7 a second encryption module, for re-encrypting the decrypted program material
8 according to the second encryption key; and

9 a fourth decryption module, for decrypting the re-encrypted program material
10 according to the second encryption key.

1 19. The apparatus of claim 18, wherein the conditional access module further
2 comprises:

3 a pre-buy module, for controlling the first decryption module.

1 20. The apparatus of claim 18, wherein the access control information further
2 comprises metadata describing at least one right for the program material.

1 21. The apparatus of claim 20, wherein pre-buy module generates replay right
2 data from the metadata.

1 22. The apparatus of claim 21, further comprising a buy module,
2 communicatively coupled to the pre-buy module.

1 23. The apparatus of claim 22, wherein the buy module comprises:
2 a purchase module for accepting buy data and comparing the buy data and the
3 replay right data from the pre-buy module; and
4 a control module for controlling the second decryption module based on the
5 comparison between the buy data and the replay right data.

1 24. The apparatus of claim 23, further comprising a billing module, for
2 recording the buy data.

1 25. The apparatus of claim 18, wherein the second encryption key is stored in
2 the conditional access module.

1 26. The apparatus of claim 18, wherein the third encryption key is stored in
2 the conditional access module.

1 27. The apparatus of claim 17, wherein the conditional access module is
2 releaseably communicative coupleable to:
3 a tuner for receiving the encrypted access control information and the program
4 material encrypted according to a first encryption key;
5 a third decryption module, for decrypting the program material using the first
6 encryption key from the conditional access module
7 a second encryption module, for re-encrypting the decrypted program material
8 according to the key; and
9 a media storage device.

1 28. An apparatus for storing program material for replay, comprising:
2 means for accepting encrypted access control information and the program
3 material encrypted according to a first encryption key, the access control information
4 including a first encryption key and control data;
5 means for decrypting the received access control information to produce the first
6 encryption key;
7 means for decrypting the program material using the first encryption key;
8 means for re-encrypting the program material using according to a second
9 encryption key;
10 means for encrypting the second encryption key according to a third encryption
11 key to produce a fourth encryption key; and
12 means for providing the re-encrypted program material and a fourth encryption
13 key for storage.

1 29. The apparatus of claim 28, wherein the encrypted access control
2 information further comprises temporally-variant control data, and the apparatus further
3 comprises:

4 means for decrypting the received access control information to produce the
5 temporally-variant control data; and

6 means for modifying the temporally variant control data to generate temporally-
7 invariant control data.

1 30. The apparatus of claim 28, wherein the means for decrypting the received
2 access control information to produce the first encryption key and the means for
3 encrypting the second encryption key according to a third encryption key to produce a
4 fourth encryption key are implemented in a conditional access module.

1 31. The apparatus of claim 30, wherein the conditional access module is
2 implemented on a smartcard communicatively coupleable to a tuner and a media storage
3 device.

1 32. The apparatus of claim 28, wherein the access control information further
2 comprises metadata describing at least one right for the program material.

1 33. The apparatus of claim 32, further comprising:
2 means for generating the second encryption key at least in part from the metadata.

1 34. The apparatus of claim 32, further comprising:
2 means for generating replay right data from the metadata.

1 35. The apparatus of claim 34, wherein the means for generating the replay
2 right data further generates replay right data from pre-buy data.

1 36. The apparatus of claim 30, further comprising:
2 means for retrieving the stored re-encrypted program material and the fourth
3 encryption key;
4 means for decrypting the fourth encryption key using the third encryption key to
5 produce the second encryption key; and
6 means for decrypting the re-encrypted material using the second encryption key.

1 37. The apparatus of claim 36, wherein the means for decrypting the fourth
2 encryption key using the third encryption key to produce the second encryption key is
3 performed in response to a subscriber request to access the program material.

1 38. The apparatus of claim 37, wherein the access control information further
2 comprises metadata describing at least one right for the program material, the subscriber
3 request to access the program material comprises buy data, and the apparatus further
4 comprises:
5 means for generating replay right data from the metadata;
6 means for accepting the buy data;
7 means for comparing the buy data with the replay right data; and
8 means for decrypting the fourth encryption key using the third encryption key to
9 produce the second encryption key according to the comparison between the buy data and
10 the replay right data.

1 39. The apparatus of claim 38, wherein:
2 the second encryption key and the third encryption key are stored in a smartcard,
3 and the replay right data is generated from the metadata and the pre-buy message in the
4 smartcard; and
5 the means for accepting the buy data, means for comparing the buy data with the
6 replay right data, and means for decrypting the fourth encryption key using the third
7 encryption key to produce the second encryption key according to the comparison
8 between the buy data and the replay right data is implemented in the smartcard.

1 40. The apparatus of claim 28, wherein the re-encrypted program material and
2 the fourth encryption key are stored on a media storage device.

1 41. The apparatus of claim 28, wherein the control data is temporally-variant.

1 42. The apparatus of claim 41, wherein the temporally-variant control data
2 associates an expiration time with the program material.

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